Service Manual

DPR-15/RD-15

DAB DIGITAL RADIO

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SPECIFICATION

DAB(BAND Ⅲ) ELECTRICAL PERFORMANCE

Model: DPR-15	Brand: SANGEAN	Temp: 25℃	R.H.:75 %	Date: 2004/9/3

Test Item	Condition		CH	Limit	Typical	Test no.		Unit
						1.	2.	
RF Freq. Range		Min	5A					CH
		Max	13F					CH
Adjacent Channel Selectivity	Fc : -70 dBm (Wanted channel) Fi : ≧ -38 dBm (Unwanted channel) (Measurement to EN50248)		10A	30	33			dB
Far-off Selectivity	Fc : -70 dBm (Wanted channel) Fi : ≧ -25 dBm FM 75Khz/dev. Fc ±5MHz (Unwanted channel) (Measurement to EN50248)		10A	43	53			dB
Sensitivity	Without pop noise		5A	-92	-94			dBm
			10A	-93	-95			dBm
			12B	-93	-95			dBm
			13F	-92	-94			dBm
S/N Ratio	Without pop noise		10A	50	56			dB
Max. input Signal : Without pop noise			10A	-10	0			dBm
Acquisition Selectivity	(Measurement to EN50248)		5A	-96	-99			dBm
			10A	-97	-100			dBm
			12B	-97	-100			dBm
			13F	-96	-99			dBm
Output Power 1kHz	10%T.H.D.			800	600			mW
T. H. D.				1	3			%
Low battery Indication on			10A	4.4	4.2			V
FREQ RESPONSE	AT CHANNEL 10A CHANGE SERVICE AF		125HZ	+4	+7			dB
			8KHZ	+4	+7			dB
Supply Voltage：DC：6V	R.O. : 50mW		Load: 4 Ohm			Modulation :1kHz		

Channel	Freq.(MHz)		Channel	Freq.(MHz)		Channel	Freq.(MHz)
5A	174.928		10A	209.936		12B	225.648
13F	239.200						

	Approved by	Released/Tested by
( )The head of product ( )Client Spot Check ( )Finished Product ( )Routine Spot Check ( )Semi-finished Product ( )Engineering Modify ( )New Model ( )Business Sample		

SPECIFICATION

DAB(BAND Ⅲ) ELECTRICAL PERFORMANCE

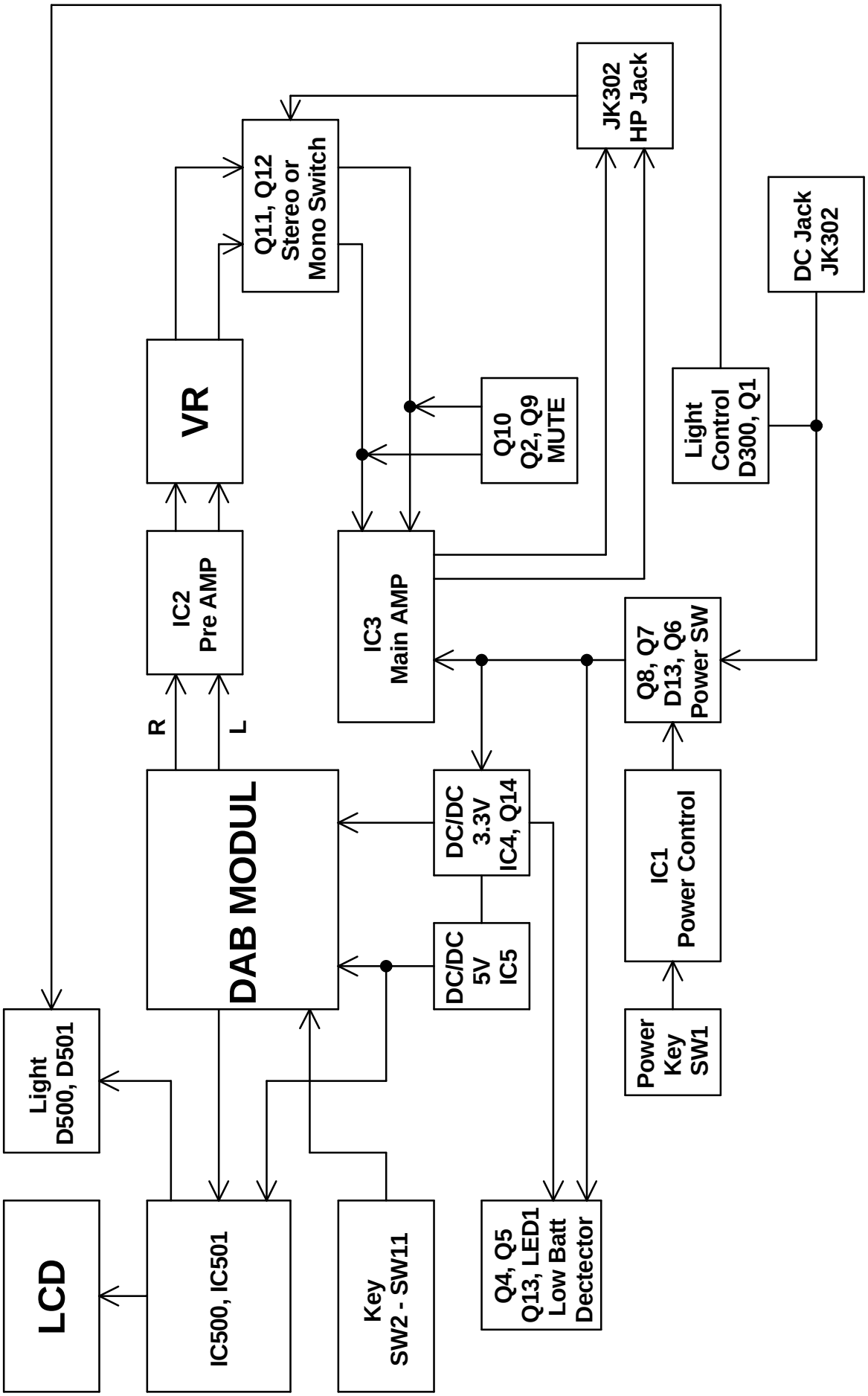
Model: RD-15	Brand: Roberts	Temp: 25℃	R.H.:75 %	Date: 2004/9/3

Test Item	Condition		CH	Limit	Typical	Test no.		Unit
						1.	2.	
RF Freq. Range		Min	5A					CH
		Max	13F					CH
Adjacent Channel Selectivity	Fc : -70 dBm (Wanted channel) Fi : ≧ -38 dBm (Unwanted channel) (Measurement to EN50248)		10A	30	33			dB
Far-off Selectivity	Fc : -70 dBm (Wanted channel) Fi : ≧ -25 dBm FM 75Khz/dev. Fc ±5MHz (Unwanted channel) (Measurement to EN50248)		10A	43	53			dB
Sensitivity	Without pop noise		5A	-92	-94			dBm
			10A	-93	-95			dBm
			12B	-93	-95			dBm
			13F	-92	-94			dBm
S/N Ratio	Without pop noise		10A	50	56			dB
Max. input Signal : Without pop noise			10A	-10	0			dBm
Acquisition Selectivity	(Measurement to EN50248)		5A	-96	-99			dBm
			10A	-97	-100			dBm
			12B	-97	-100			dBm
			13F	-96	-99			dBm
Output Power 1kHz	10%T.H.D.			800	600			mW
T. H. D.				1	3			%
Low battery Indication on			10A	4.4	4.2			V
FREQ RESPONSE	AT CHANNEL 10A CHANGE SERVICE AF		125HZ	+4	+7			dB
			8KHZ	+4	+7			dB
Supply Voltage：DC：6V	R.O. : 50mW		Load: 4 Ohm			Modulation :1kHz		

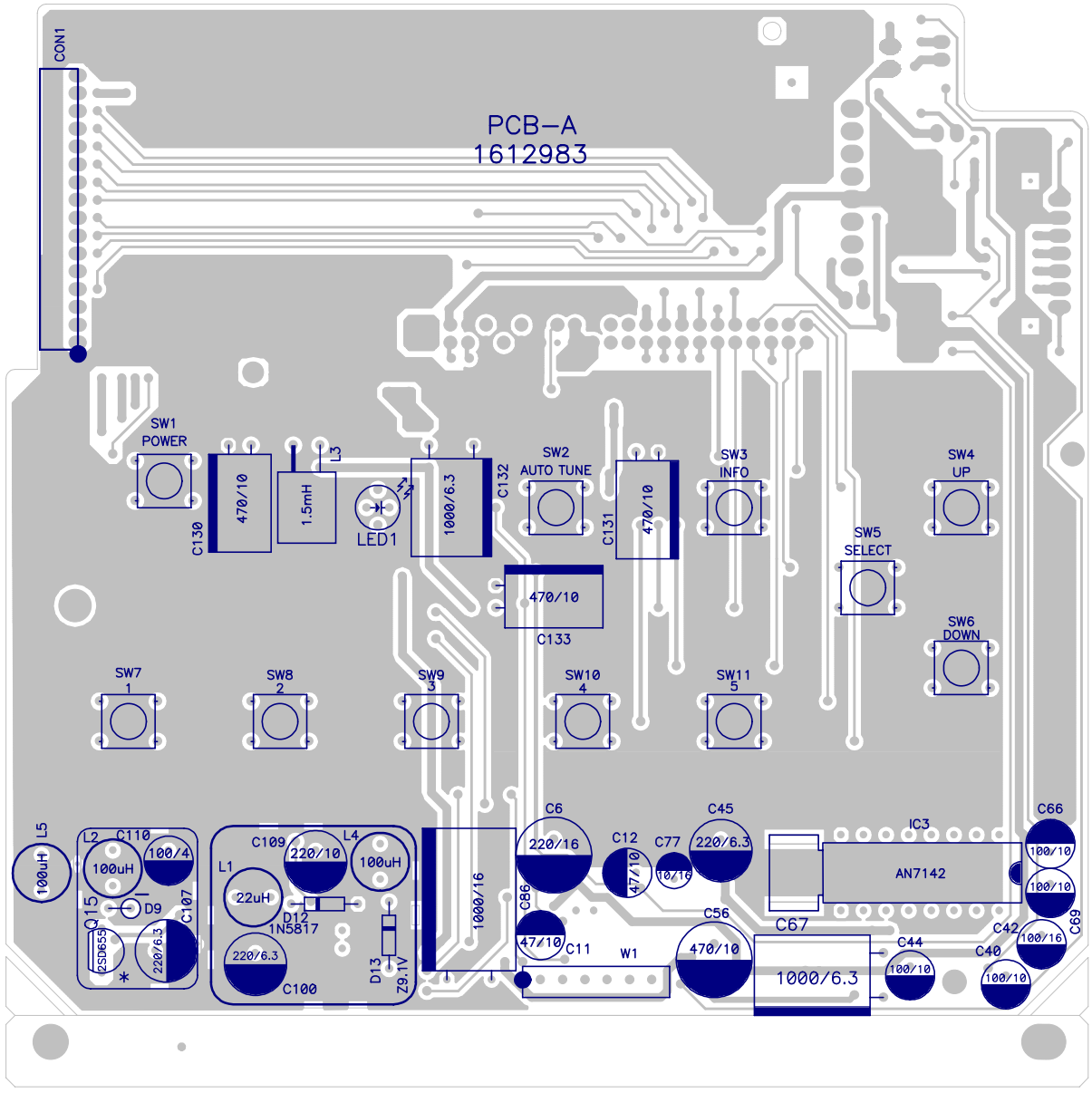
Channel	Freq.(MHz)	Channel	Freq.(MHz)	Channel	Freq.(MHz)
5A	174.928	10A	209.936	12B	225.648
13F	239.200				

	Approved by	Released/Tested by
( )The head of product ( )Client Spot Check ( )Finished Product ( )Routine Spot Check ( )Semi-finished Product ( )Engineering Modify ( )New Model ( )Business Sample		

BLOCK DIAGRAM



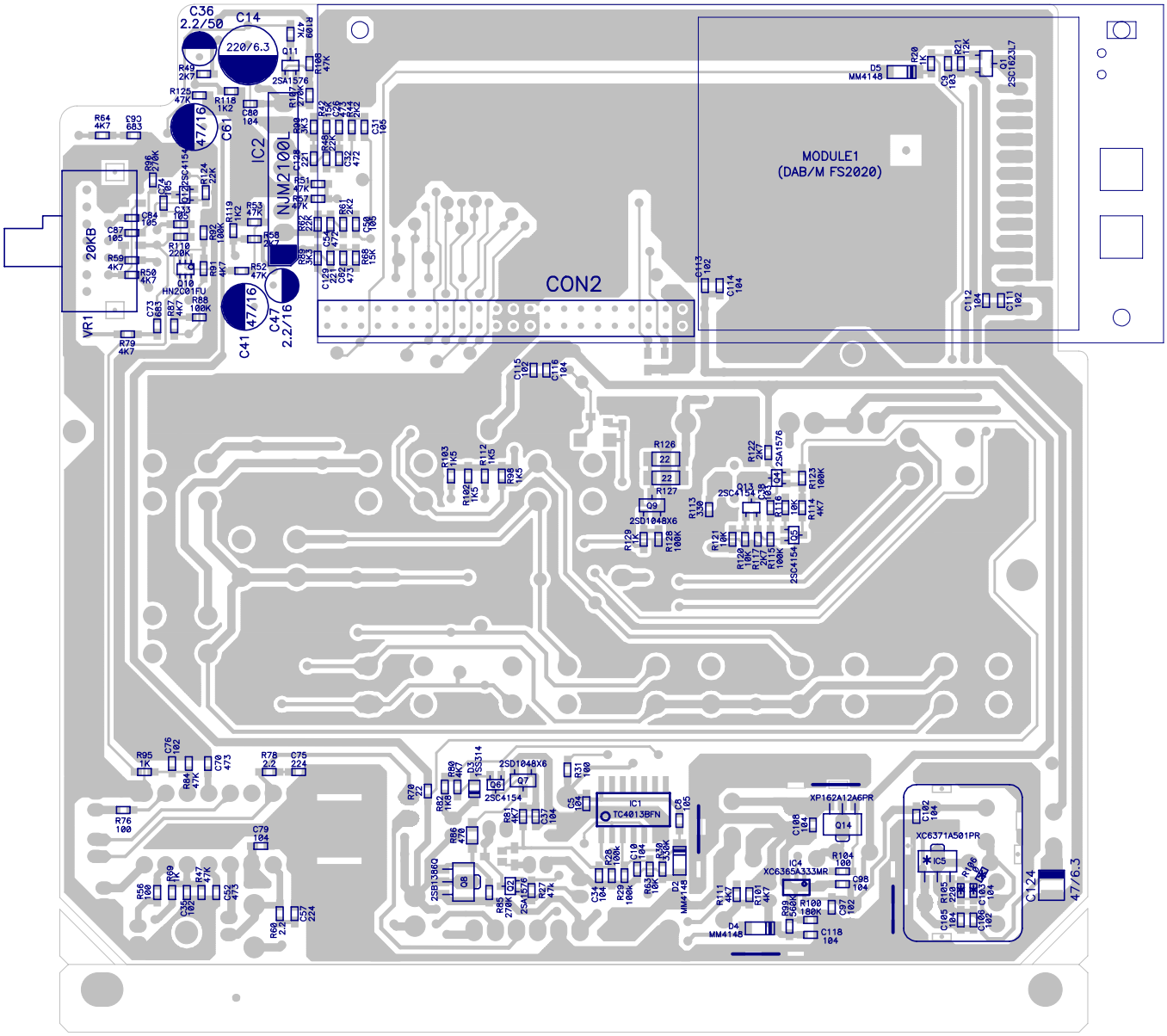
MAIN PCB TOP VIEW



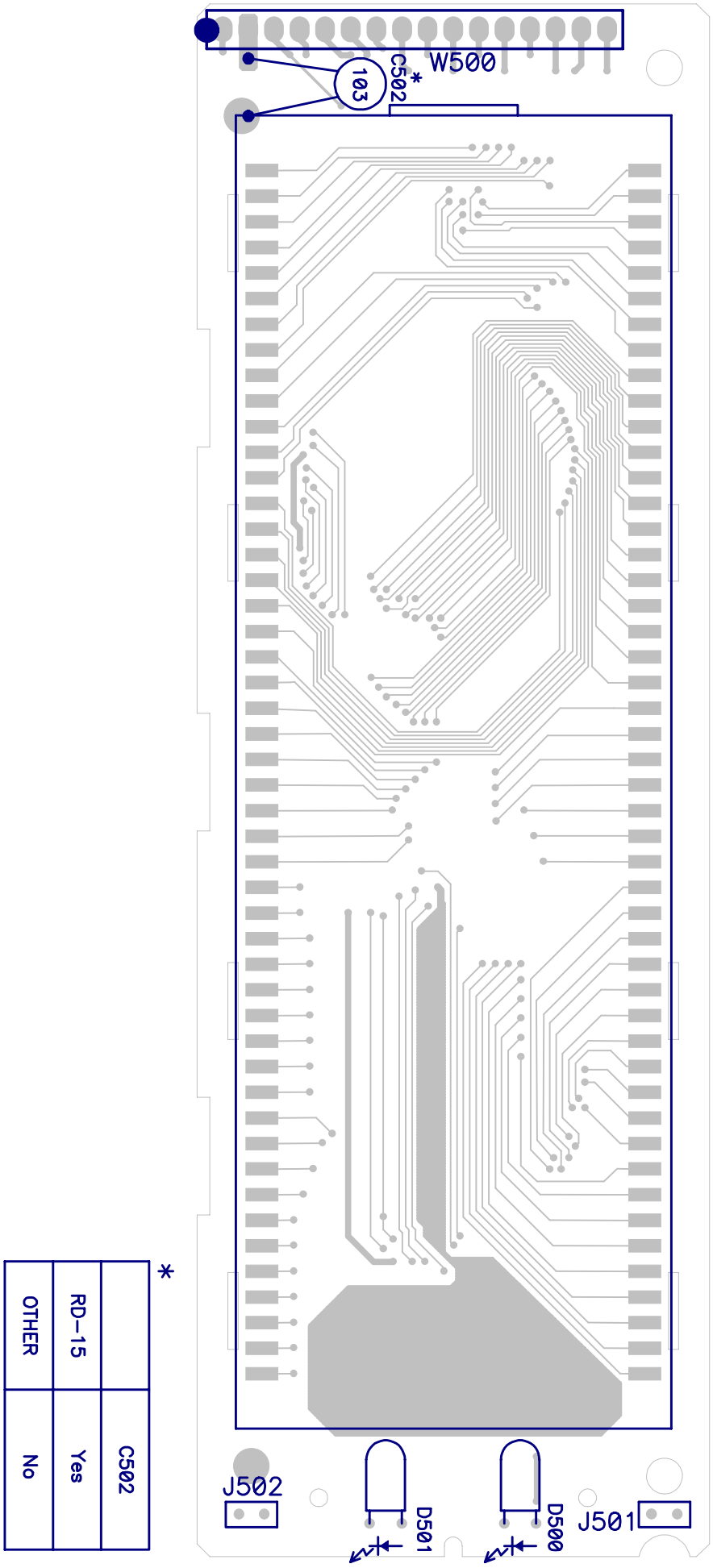
*

	Q15
DOUBLE BAND	YES
SINGLE BAND	NO

MAIN PCB BOTTOM VIEW

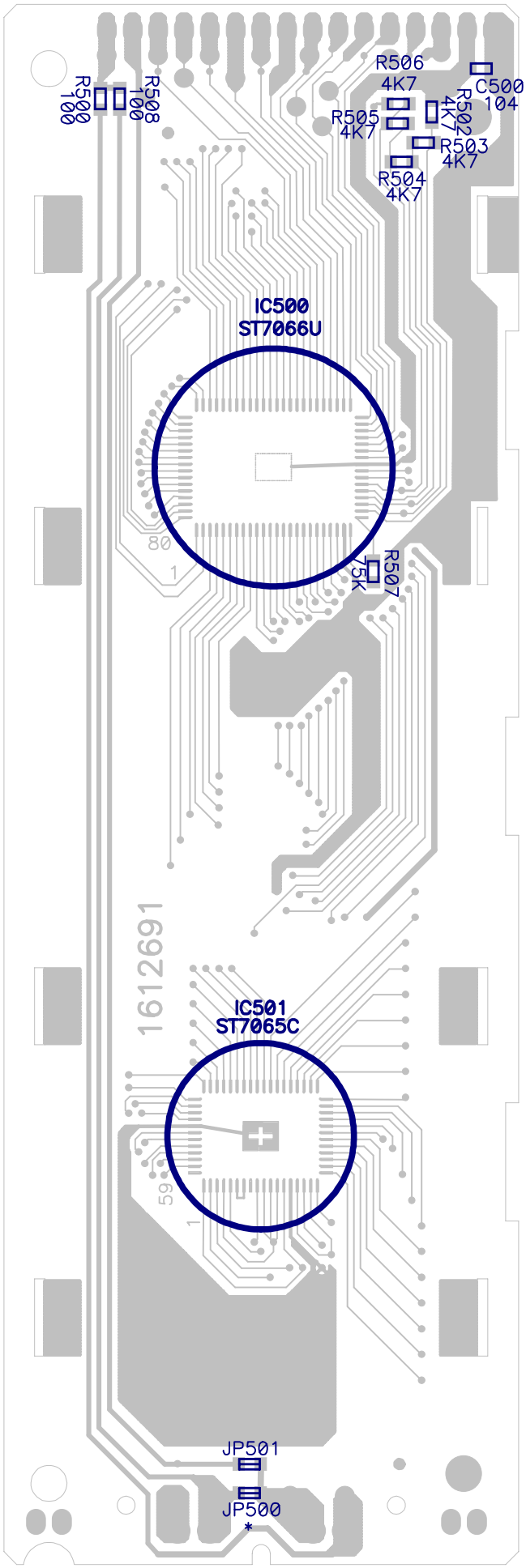


LCD PCB TOP VIEW

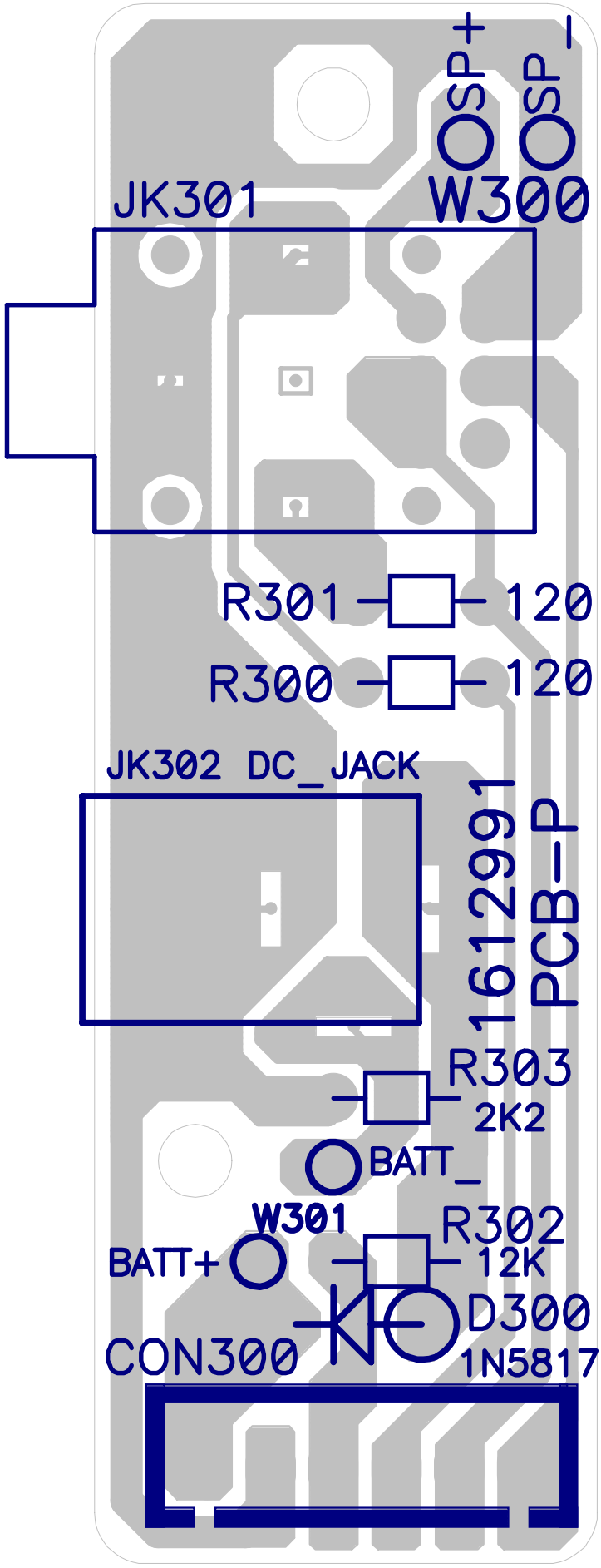


*		
	RD-15	OTHER
C502	Yes	No

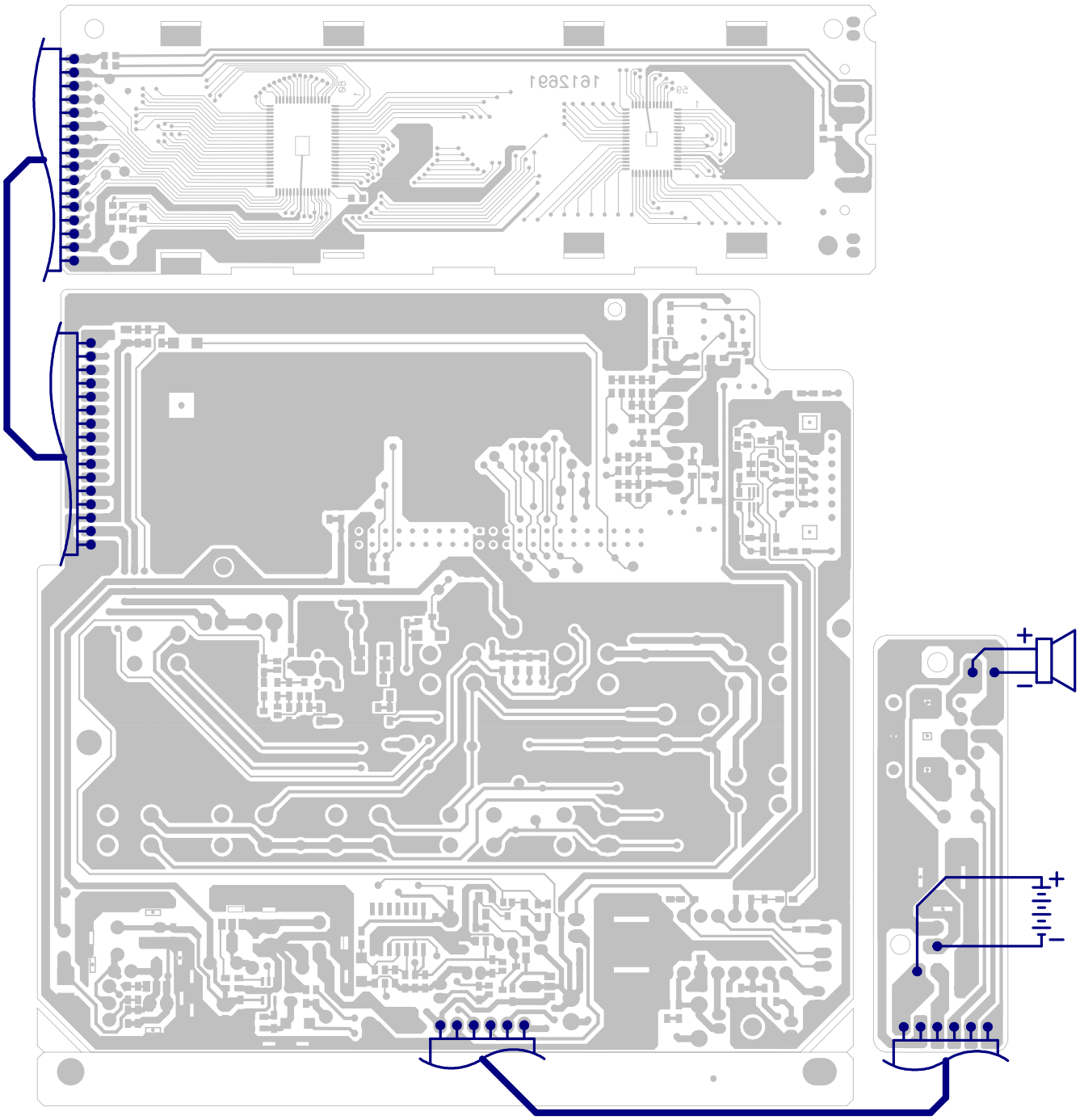
LCD PCB BOTTOM VIEW



POWER PCB TOP VIEW

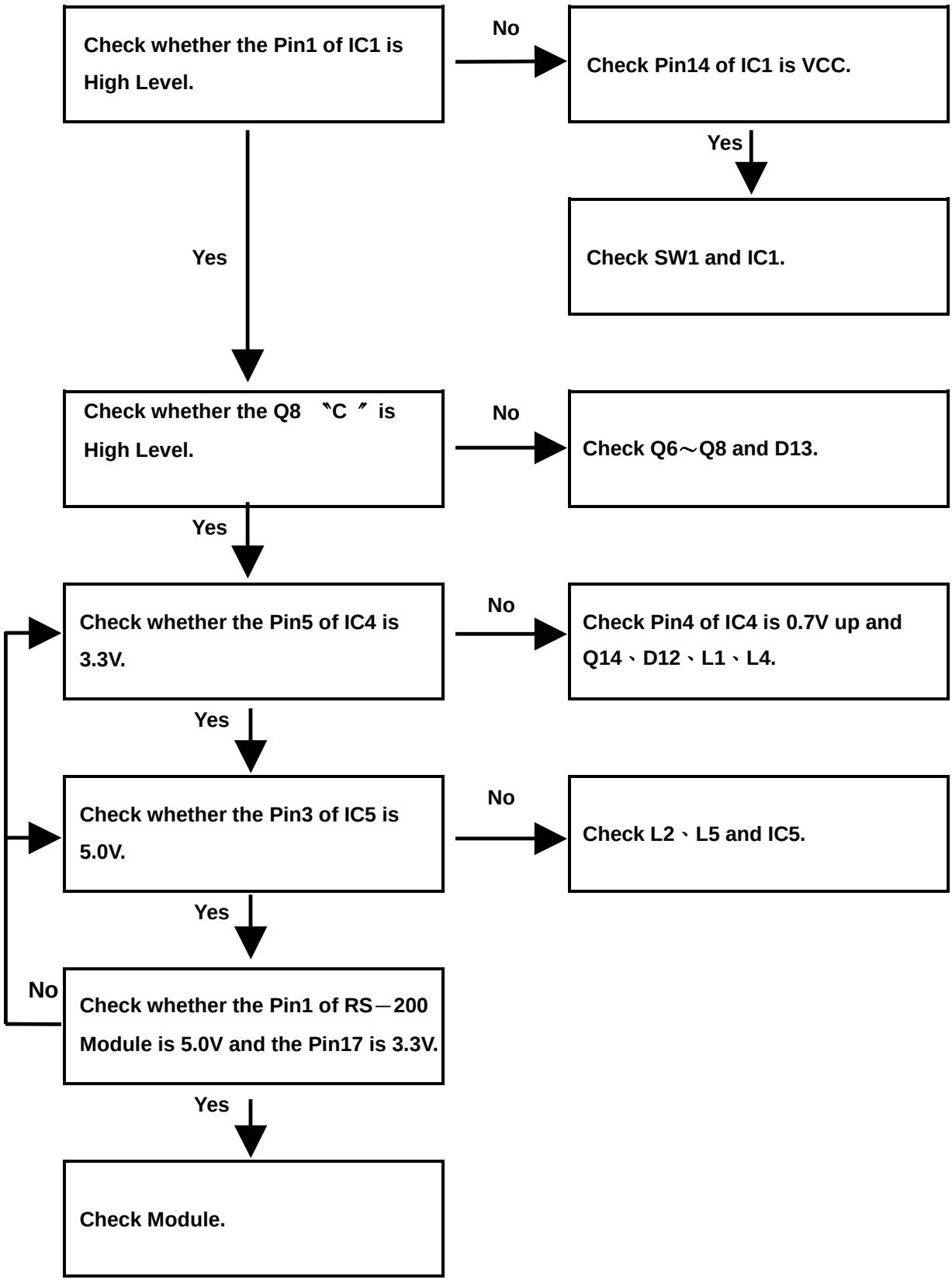


WIRING DIAGRAM



TROUBLESHOOTING FLOW CHART

Power can not be turned on


Check whether the Pin1 of IC1 is High Level.
No
Check Pin14 of IC1 is VCC.
Yes
Check SW1 and IC1.
Yes
Check whether the Q8 〝C 〞 is High Level.
No
Check Q6～Q8 and D13.
Yes
Check whether the Pin5 of IC4 is 3.3V.
No
Check Pin4 of IC4 is 0.7V up and Q14、D12、L1、L4.
Yes
Check whether the Pin3 of IC5 is 5.0V.
No
Check L2、L5 and IC5.
Yes
No
Check whether the Pin1 of RS－200 Module is 5.0V and the Pin17 is 3.3V.
Yes
Check Module.

ELECTRICAL PARTS LIST

RD-15

PART NO.	DESCRIPTION	Q'TY	REMARK
1012071	IC NJM2100L	1	IC 2,
1012250	IC AN7142	1	IC 3,
1013460	CH IC XC6365A333MR	1	IC 4,
1013550	CH IC ST7065C (DICE)	1	IC 501,
1013620	CH IC TC 4013BFN	1	IC 1,
1013630	CH IC XC6371A501PR	1	IC 5,
1020240	CH TR 2SC1623 L6	1	Q 1,
1020420	CH TR 2SA1576A/R	4	Q 2-4,11,
1021090	CH TR 2SB1386Q hfe=120	1	Q 8,
1022272	CH TR 2SC4154-G	4	Q 5,6,12,13,
1023010/1	CH TR 2SD1048 X6	2	Q 7,9,
1026000	CH TR HN2C01FU-Y	1	Q 10,
1030240	CH FET XP162A12A6PR	1	Q 14,
1041190T	DIODE 1N5817-T	3	D 9,12,300,
1045020	CH DIODE 1SS314	1	D 3,
1045170T	ZENER RD9.1EB1-T	1	D 13,
1046011	CH DIODE MM4148	3	D 2,4,5,
1050150	LED RED 3.0x5.1	1	LED1,
1059060	LED ORG 3mm 45E4YL28TS-B	2	LED500,501,
1132902	INDUCTOR COIL 22uHK	1	L 1,
1133701	INDUCTOR COIL 100uHK	3	L 2,4,5,
1135100S	FIXED COIL 1.5mH-S	1	L 3,
1316124	R-VR 20KB x2(125A)	1	VR 1,
1600600	LCD DPR-5	1	LCD500,
1612691	PCB D DPR-2	1	
1612983	PCB A RD-15	1	PCB1,
1612991	PCB P RD-15	1	PCB300,
1620950	SPK 3" 4Ω 3W	1	SP 300,
1630680	TOUCH SW (A)	11	SW 1-11,
1640060	JACK HP(F)	1	JK 301,
1647100	JACK DC-470AG PBT 2.0L	1	JK 302,
1701086	CNT BASE 2.5x6P	1	CON300,
170131G	CNT BASE 2x16P-R	1	CON1,
170132G	PIN BASE 2x16P-R	1	CON500,
170133M	PIN BASE 2x22Px2-S	1	CON2,
*1704830	W/ASS'Y 220(2.5+6P)	1	W 1,
1900360	W/SPK 200(6+2P)	1	W 300,
*1900670	DAB/M FS2020 DPR-15	1	MODULE 1,
4110364CS	CC 103Z 50V F-S	1	C 502,
4422560S	EL 225M 50V 4x7(1.5)-S	2	C 36,47,
4410637S	EL 106M 16V 4x7-S	1	C 77,
4447631S	EL 476M 16V 5x11-S	2	C 61,41,
441070JT0	EL 107M 4V 5x7	1	C 110,
4422711S	EL 227M 6.3V 6x8-S	5	C 14,45,100,107,109,
442273QS	EL 227M 16V 8x9-S	1	C 6,
444772QS	EL 477M 10V 8x9-S	1	C 56,
4447790S	EL 477M 10V 6.3x11-S	3	C 130,131,133,
4410810S	EL 108M 6.3V 10x12.5(5)S	1	C 67,
4410811S	EL 108M 6.3V 8x11.5-S	1	C 132,
441083KS	EL 108M 16V 10x16-S	1	C 86,
4H47621S	EL 476M 10V 5x7-S	2	C 11,12,
4H10721S	EL 107M 10V 5x7-S	4	C 40,44,66,69,
4H10731S	EL 107M 16V 6.3x7-S	1	C 42,
5010261	CH CC 102K 50V X7R-C	7	C 35,76,97,106,111,113 ,115,
5010361	CH CC 103K 50V X7R-C	2	C 9,38,
5010471	CH CC 104Z 25V Y5V-C	14	C 5,10,34,37,79,80,98,

ELECTRICAL PARTS LIST

RD-15

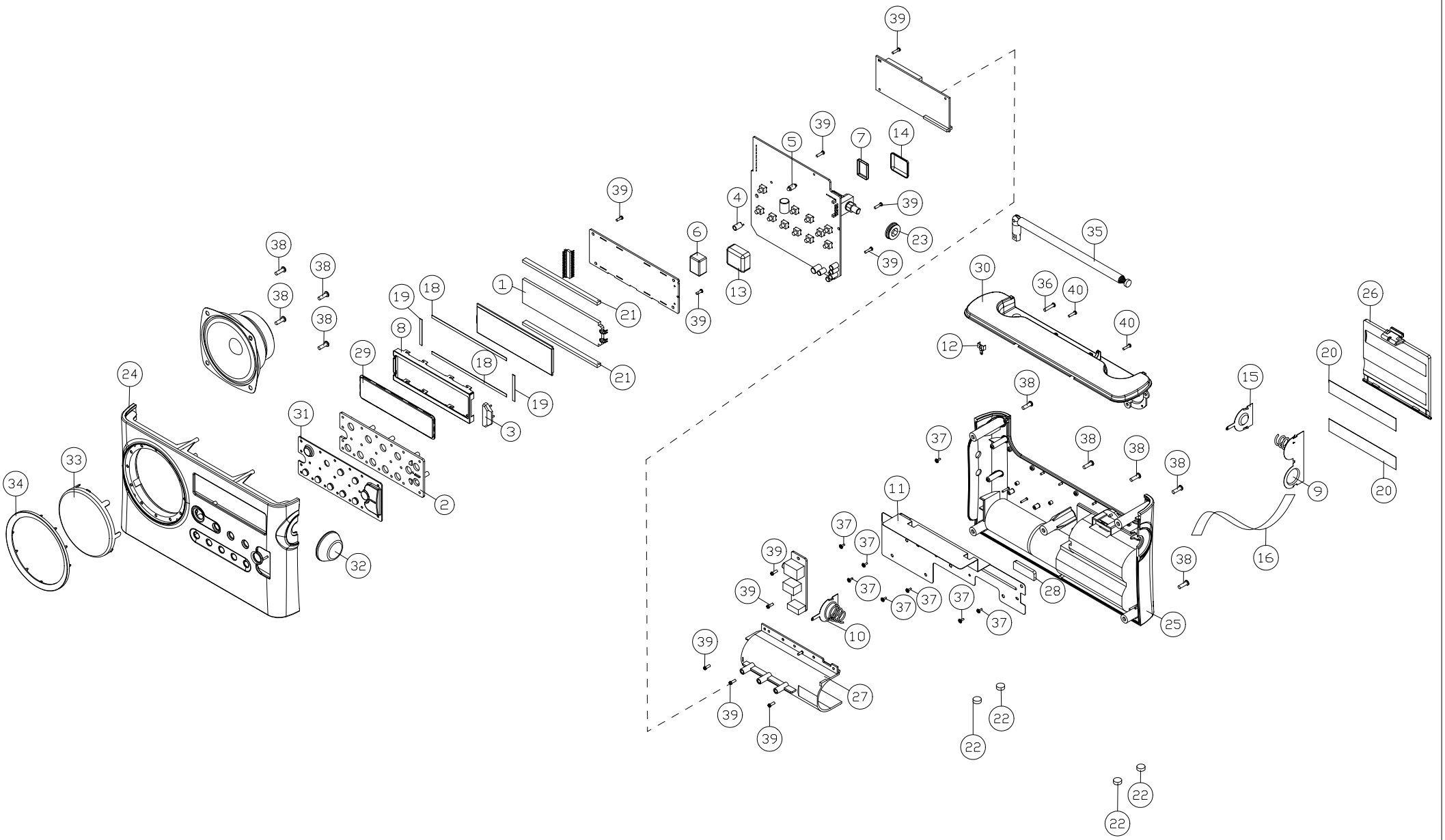
PART NO.	DESCRIPTION	Q'TY	REMARK
5010557	CH CC 105Z 10V F-C	7	C 8,31,33,50,74,84,87,
5022101	CH CC 221J 50V NPO-C	2	C 128,129,
5022446	CH CC 224Z 25V Y5V-C	2	C 57,75,
5047261	CH CC 472K 50V X7R-C	2	C 32,54,
5047365	CH CC 473Z 50V Y5V-C	4	C 26,52,62,70,
5068351	CH CC 683K 16V R-C	2	C 63,73,
6010525	RD 1/8W 120J SM5	2	R 300,301,
6010740T	RD 1/8W 2.2KJ-T	1	R 303,
6010749T	RD 1/8W 12KJ-T	1	R 302,
6100104	CH RD 1/16W 2.2J-C	2	R 60,78,
6100116	CH RD 1/16W 22J-C	1	R 70,
6100124	CH RD 1/16W 100J-C	6	R 31,56,76,104,500,508 ,
6100130	CH RD 1/16W 330J-C	1	R 113,
6100136	CH RD 1/16W 1KJ-C	4	R 20,69,95,129,
6100137	CH RD 1/16W 1.2KJ-C	2	R 118,119,
6100138	CH RD 1/16W 1.5KJ-C	4	R 98,102,103,112,
6100139	CH RD 1/16W 1.8KJ-C	1	R 82,
6100140	CH RD 1/16W 2.2KJ-C	2	R 44,61,
6100141	CH RD 1/16W 2.7KJ-C	4	R 49,58,117,122,
6100142	CH RD 1/16W 3.3KJ-C	2	R 89,90,
6100144	CH RD 1/16W 4.7KJ-C	16	R 50,59,64,79,80,81,87 ,91,101,111,502-506, 114,
6100148	CH RD 1/16W 10KJ-C	4	R 63,116,120,121,
6100149	CH RD 1/16W 12KJ-C	1	R 21,
6100150	CH RD 1/16W 15KJ-C	2	R 42,68,
6100152	CH RD 1/16W 22KJ-C	3	R 48,62,124,
6100156	CH RD 1/16W 47KJ-C	10	R 27,47,51-53,57,84, 108,109,125,
610015G	CH RD 1/16W 75KJ-C	1	R 507,
6100160	CH RD 1/16W 100KJ-C	7	R 28,29,88,92,115,123, 128,
6100163	CH RD 1/16W 180KJ-C	1	R 100,
6100164	CH RD 1/16W 220KJ-C	1	R 110,
6100165	CH RD 1/16W 270KJ-C	3	R 85,96,107,
6100166	CH RD 1/16W 330KJ-C	1	R 30,
6100169	CH RD 1/16W 560KJ-C	1	R 99,
6100194	CH RD 1/16W OJ-C	2	JP 501,R106,
6110116	CH RD 1/8W 22J-B	2	R 126,127,
6160132	CH RD 1/10W 470J-A	1	R 86,
8000010	W/JUMP 5(10)0.6mm	1	JP 1,
81416J0	W/PVC 100(6+3) BLK	1	W 100,
8592750	W/2 270(6+6) R/B	1	W 301,
8601820	W/SHIELD 180(2.5+2.5)	1	RF WIRE

MECHANICAL PARTS LIST

RD-15

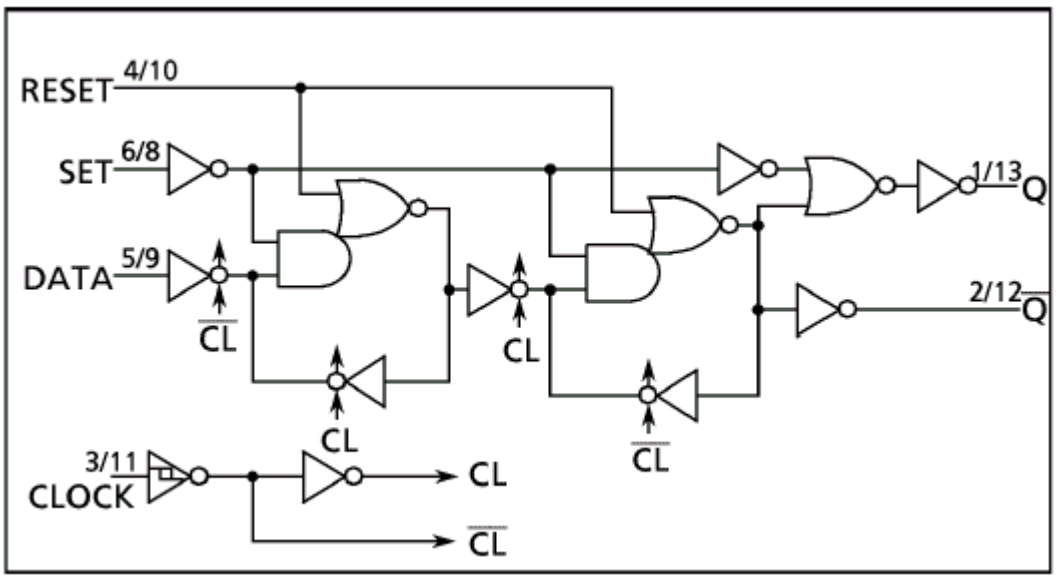
REF NO	PART NO	DESCRIPTION	Q'TY	DWG NO	REMARK
1	20K4001	LCD LIGHT LENS	1	A4-RD2-04A	
2	20M3000	RUBBER KEY HOLDER	1	A2-RD15-08	
3	20M3010	LED COVER	1	A4-RD15-19	
4	20M3020	LED HOLDER	1	品固-LED-8T	
5	20M3030	A-PCB HOLDER	1	品固PCE-03	
6	2159010	DC/DC SHIELD (UP)	1	A4-800-1218A	
7	2159020	DC/DC SHIELD (DOWN)	1	A4-800-1217	
8	21K4000A	LCD HOLDER	1	A3-RD2-08A	
9	21K9000	BATTERY CONTACT (+)(-)	1	A3-TONE-35A	
10	21K9120	BATTERY CONTACT ASS'Y	1	A4-TONE-51A	
11	*21M3000	GROUND PLANE	1	A3-RD15-21	
12	21M3010	ROD ANT LUG	1	A4-RD15-22	
13	21M3020	DC/DC SHIELD(UP)(3.3V)	1	A4-RD15-23	
14	21M3030	DC/DC SHIELD(DOWN)(3.3V)	1	A4-RD15-24	
15	21M3040	BATTERY CONTACT (+)	1	A4-RD15-28	
16	22M3010	RIBBON	1	A4-RD15-30	
17	23K4000	PVC FLIM	1	A4-RD2-17A	
18	23K8030	LCD HOLDER NEP	2	A4-DDR3-25	
19	23K8110	NEP SPACER(E)	2	A4-DDR3-26	
20	23M3000	BATTERY COVER SPONGE	2	A4-RD15-29	
21	24K4000	CONDUCT RUBBER	2	A3-RD2-06A	
22	24M3000	PAD	4	A4-RD15-13	
23	24M3010	VR-KNOB SPACER	1	A4-RD15-27	
24	301M301	FRONT CABINET	1	A1-RD15-01	
25	303M301	BACK COVER	1	A1-RD15-02	
26	304M301	BATTERY COVER	1	A2-RD15-09	
27	304M301-1	BATT CASE	1	A3-RD15-10	
28	304M301-2	BATTERY CASE COVER	1	A4-RD15-11	
29	305M301	DIAL WINDOW	1	A3-RD15-07	
30	307M301A	TOP COVER	1	A1-RD15-03	
31	313M301	PUSH RUBBER KEY	1	A2-RD15-05	
32	320M301	VR-KNOB	1	A4-RD15-18	
33	343M301	SPEAKER GRILL	1	A3-RD15-04	
34	344M301	SPK.FRAME	1	A2-RD15-06	
35	360M301A	ROD ANT	1	A1-RD15-12	
36	9002122	SCREW JMP2.6x12(NI)	1		ROD ANT
37	9090019	SCREW M1.4x4(NI)	8		TOP COVER/BACK COVER x8
38	9103082	SCREW PTP 3x8(NI)	9		SPEAKERx4 前/後CAB.x5
39	9151062	SCREW PTPW 2x6(NI)	11		BATT-CASE/BACK COVER x3 JACK-PCBx2/LCD ASS'Y/FRONT CAB.x2 A PCB/FRONT CAB.x3 DAB-MODULE/FRONT CAB x1
40	9161082	SCREW PTB M2x8(NI)	2		FRONT/TOP CAB.x2

EXPLODED VIEWS

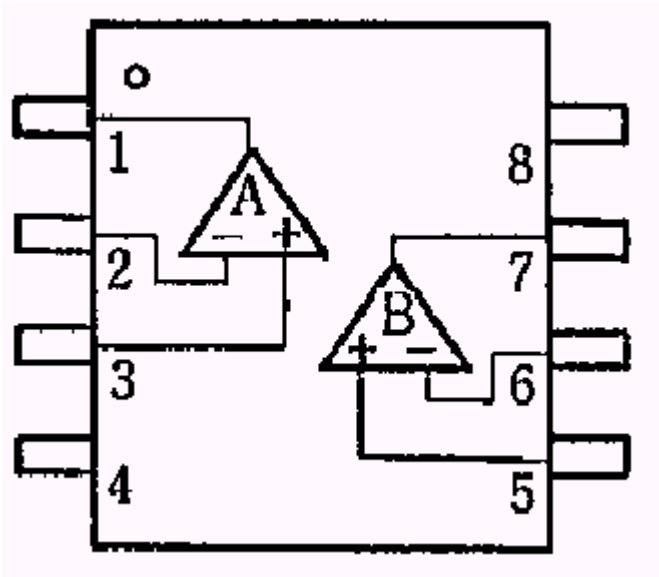


IC CIRCUIT BLOCK DIAGRAM

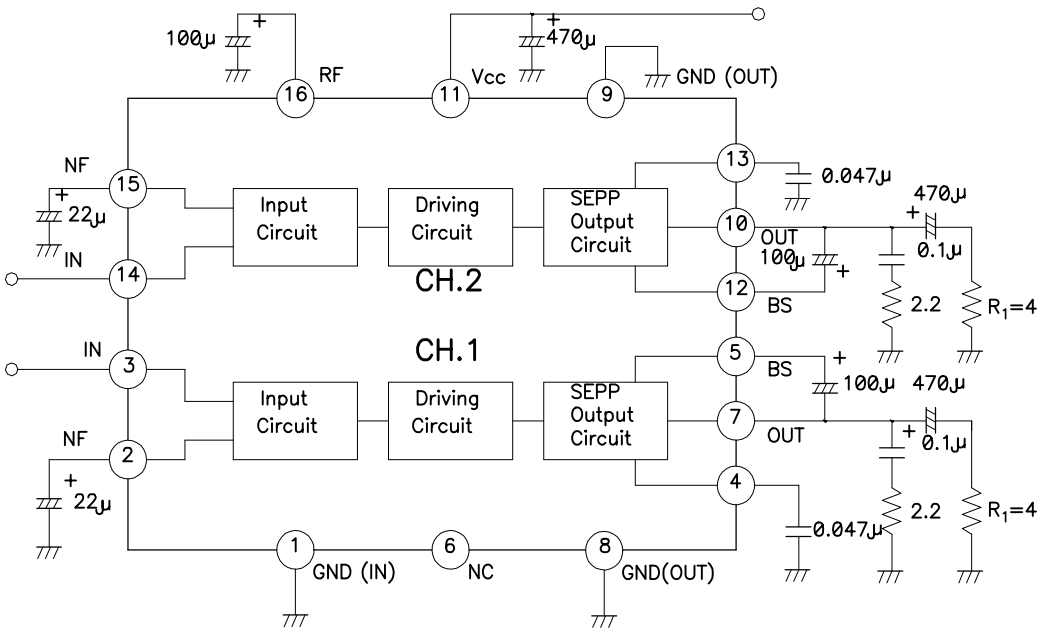
1. IC1 – TC4013BFN



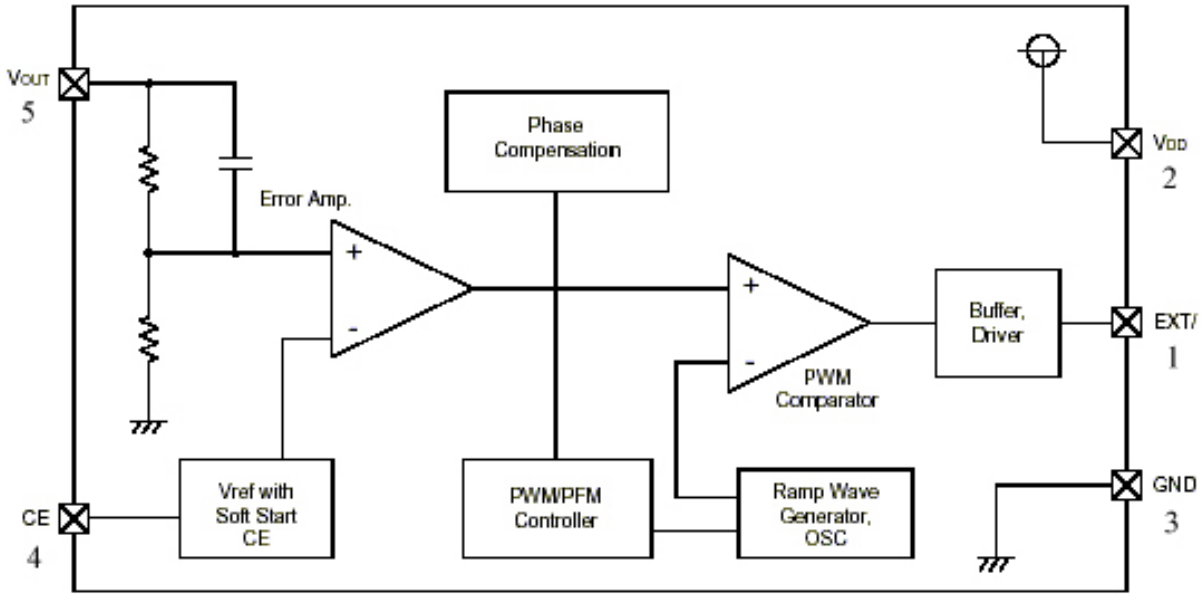
2. IC2 – NJM2100LD



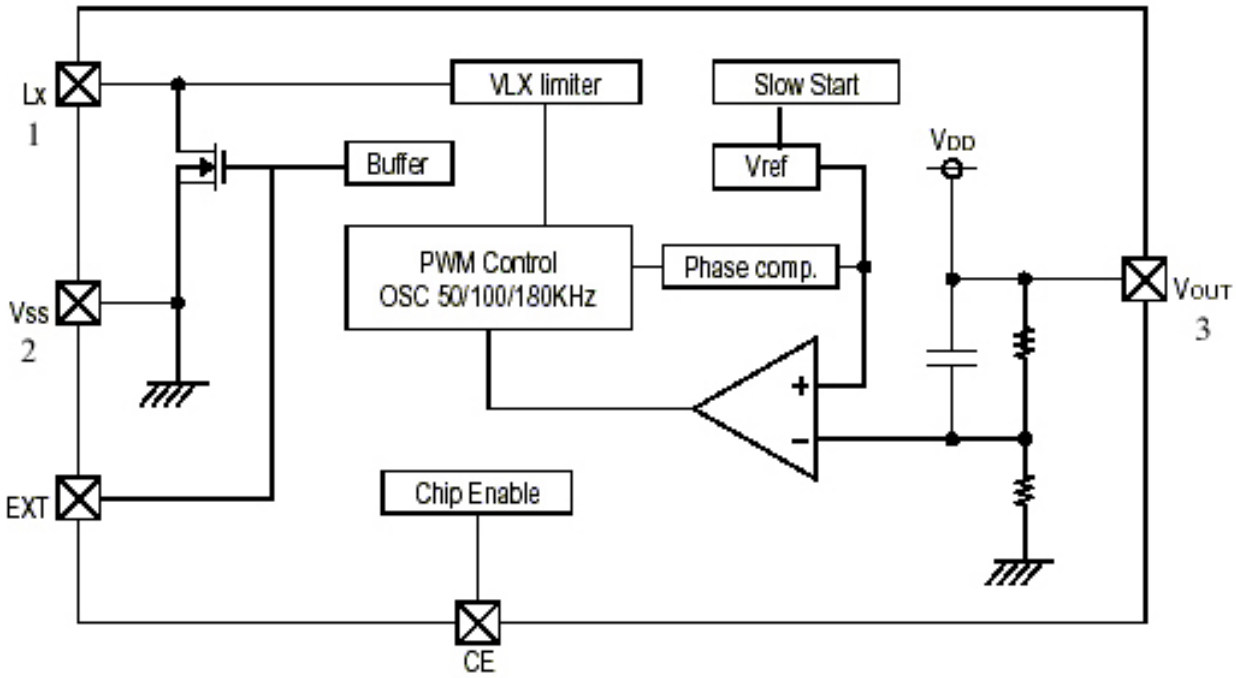
3. IC3 – AN7142



4. IC4 – XC6365A333MR



5. IC5 – XC6371A501PR



VOLTAGE LIST

IC1 – TC4013BFN

PIN	DAB
1	5.0
2	0
3	0
4	0
5	0
6	0
7	0
8	1.01
9	1.05
10	1.08
11	1.11
12	5.38
13	0
14	5.38

IC2 – NJM2100LD

PIN	DAB
1	2.69
2	2.69
3	2.67
4	0
5	2.67
6	2.69
7	2.69
8	5.35

IC3 – AN7142

PIN	DAB
1	0
2	1.31
3	0.01
4	0.63
5	5.22
6	0
7	2.78
8	0
9	0
10	2.78
11	5.45
12	5.18
13	0.63
14	0.01
15	1.31
16	5.39

IC4 – XC6365A333MR

PIN	DAB
1	2.30
2	5.30
3	0
4	1.12
5	3.32

IC5 – XC6371A501PR

PIN	DAB
1	3.21
2	0
3	5.02

Transistor

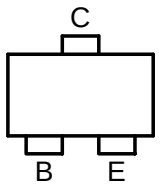
	PIN	DAB
Q1	E	0
	B	0.74
	C	0.07
Q2	E	0
	B	0
	C	0
Q4	E	5.39
	B	5.34
	C	-1.33
Q5	E	0.71
	B	0.65
	C	5.34
Q6	E	0
	B	0
	C	0.68
Q7	E	0
	B	0.68
	C	0.01

	PIN	DAB
Q8	E	5.44
	B	4.72
	C	5.39
Q9	E	0
	B	0
	C	4.9
Q11	E	5.31
	B	4.71
	C	5.29
Q12	E	1.52
	B	2.06
	C	1.53
Q13	E	0.71
	B	1.35
	C	0.71
Q14	G	2.23
	S	5.27
	D	3.36

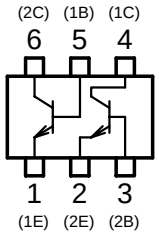
	PIN	DAB
Q10	1(1E)	0
	2(2E)	0.01
	3(2B)	0
	4(2C)	0
	5(1B)	0
	6(1C)	0

SEMICONDUCTOR LEAD IDENTIFICATIONS

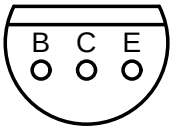
Transistors



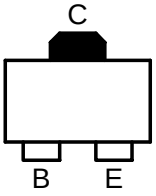
2SA812
2SA1576
2SC1623
2SC4154
2SC4081
2SD1048



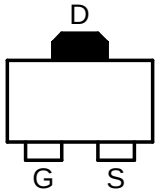
HN2C01FU



2SD655



2SB1386Q

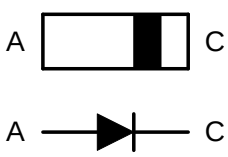


XP162A12A6PR

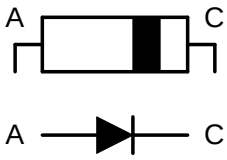
(E:Emitter C:Collector B:Base)

(S:Source G:Gate D: Drain)

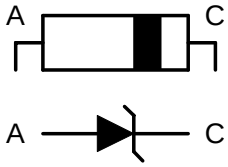
Diodes



MM4148
1SS314



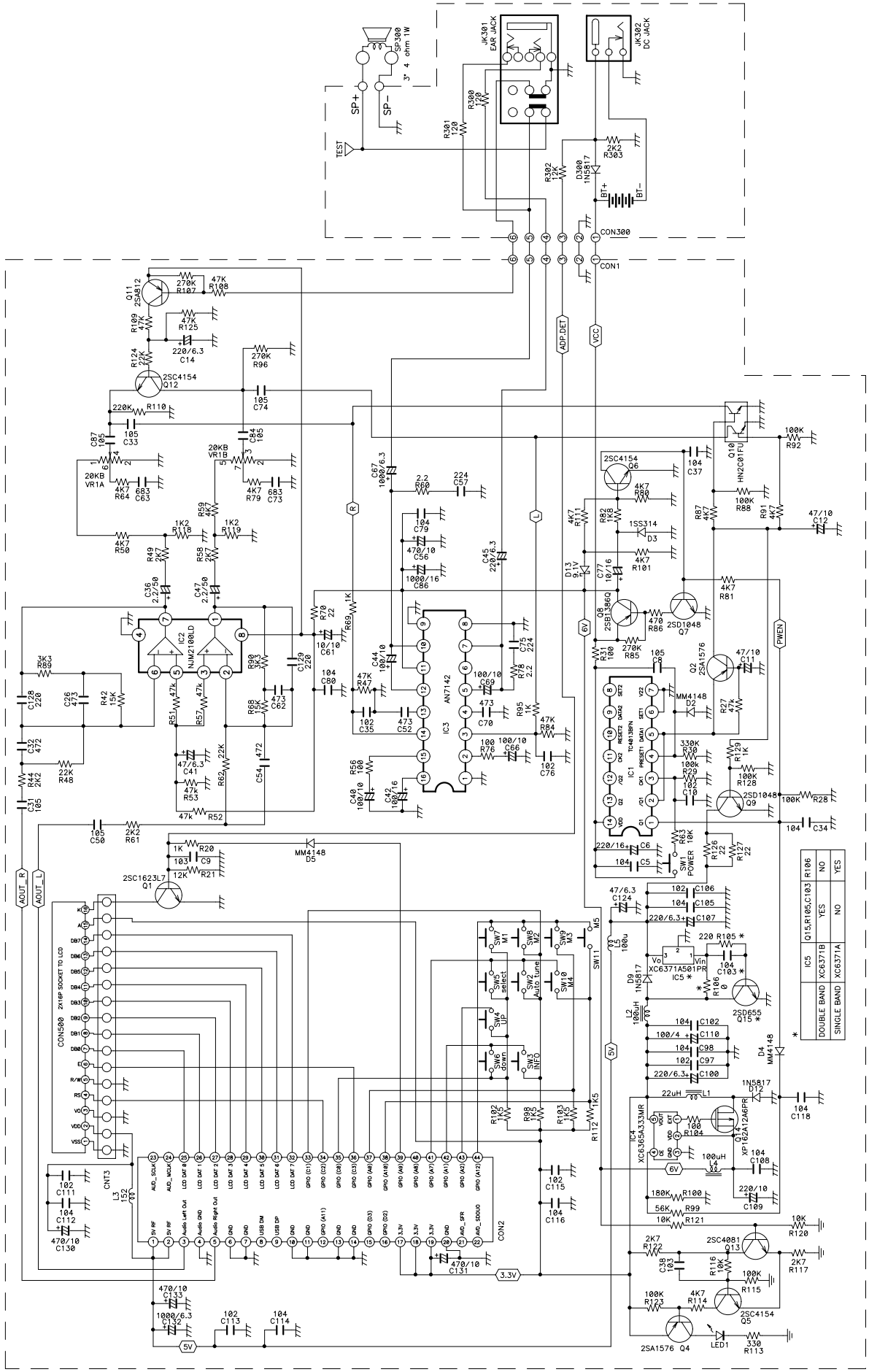
1N5817



ZENER 9.1V

(A:Anode C:Cathode)

MAIN SCHEMATIC DIAGRAM



LCD SCHEMATIC DIAGRAM